

IN THE CLAIMS:

Please cancel Claims 2, 3, 12, and 13, without prejudice or disclaimer of the subject matter presented therein.

Please amend Claims 1, 4, 10, 11, 14, 20, 22 and 23 to read as follows. For the Examiner's convenience, a copy of all the pending claims are presented below.

Sub
PDI
C1

1. (Currently Amended) A liquid discharge head comprising a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, and a protective coating provided on said heat generating element to protect said heat generating element, wherein said protective coating has a first region with a substantially uniform thickness along a direction connecting said pair of electrodes, and has a second region with a substantially uniform thickness along the direction, wherein said second region is thinner than said first region stepwise and is disposed in all cases closer to said discharge port than said first region, and wherein the volume of a liquid droplet discharged from said discharge port is changed by changing electric energy applied to said heat generating element, and wherein said protective coating is composed of plural protection layers, said first region having more layers than said second region.

2. (Cancelled)

3. (Cancelled)

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- Sub
RD1
C2
4. (Currently Amended) A liquid discharge head according to claim 31, wherein said second region is formed by forming an upper protective coating after etching a lower protective coating.

5. (Previously Amended) A liquid discharge head according to claim 4, wherein said lower protective coating is composed of phosphosilicate glass film, said upper protective coating is composed of SiN film, and said etching is conducted with buffered hydrofluoric acid.

6. (Withdrawn)

7. (Withdrawn)

8. (Withdrawn)

9. (Previously Amended) A liquid discharge head according to claim 1, wherein said heat generating element is composed of material having a positive temperature coefficient.

Sub C
RD1 Cont

10. (Currently Amended) A liquid discharge head according to claim 1, wherein said heat generating element is provided in plural numbers, a driving circuit having a plurality of function devices provided for independently driving said plurality of heat generating elements is provided within the substrate on which said heat generating elements is provided.

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Sub
ND1
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End

11. (Currently Amended) A liquid discharge head comprising a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, a protective coating provided on said heat generating element to protect said heat generating element and a moving member provided facing said heat generating element and having a free end which is displaced in accordance with generation of a bubble due to said thermal energy,

wherein said protective coating has a first region with a substantially uniform thickness along a direction connecting said pair of electrodes, and has a second region with a substantially uniform thickness along the direction, wherein said second region is thinner than said first region stepwise and is disposed in all cases closer to said discharge port than said first region, and wherein the volume of a liquid droplet discharged from said discharge port is changed by changing electric energy applied to said heat generating element, and wherein said protective coating is composed of plural protection layers, said first region having more layers than said second region.

12. (Cancelled)

13. (Cancelled)

Sub
ND1
C4
Cont

14. (Currently Amended) A liquid discharge head according to claim 13 11, wherein said second region is formed by forming the upper protective coating after etching the lower protective coating.

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15. (Previously Amended) A liquid discharge head according to claim

14, wherein said lower protective coating is composed of phosphosilicate glass film, said

upper protective coating is composed of SiN film, and said etching is conducted with

buffered hydrofluoric acid.

16. (Withdrawn)

17. (Withdrawn)

18. (Withdrawn)

19. (Previously Amended) A liquid discharge head according to claim

19 wherein said heat generating element is composed of polycrystalline silicon.

20. (Currently Amended) A liquid discharge head according to claim

11, wherein said heat generating element is provided in plural numbers, a driving circuit having a plurality of function devices provided for independently driving said plurality of heat generating elements is provided within the substrate on which said heat generating elements is provided.

21. (Previously Amended) A liquid discharge apparatus comprising the

liquid discharge head according to claim 1 or 11 and a member for mounting said liquid discharge head.

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Sub
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C's
Cont

22. (Currently Amended) A liquid discharge method using a liquid discharge head having a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, and a protective coating for protecting the heat generating element, provided on the heat generating element, said protective coating having a first region with a substantially uniform thickness along a direction connecting the pair of electrodes, and having a second region with a substantially uniform thickness along the direction, wherein said second region is thinner than the first region stepwise and is disposed in all cases closer to said discharge port than said first region.

wherein a size of a bubble generated on the heat generating element is changed by changing electric energy applied to the heat generating element to generate a bubble on both the first region and the second region or on only the second region, and wherein the volume of a liquid droplet discharged from the discharge port is changed, and wherein said protective coating is composed of plural protection layers, said first region having more layers than said second region.

23. (Currently Amended) A liquid discharge method using a liquid discharge head having a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, a protective coating for protecting the heat generating element, provided on the heat generating element and a moving member provided facing the heat generating element and having a free end which is displaced in accordance with generation of a bubble due to the thermal energy, the protective coating having a first region with a substantially uniform thickness along a direction connecting the pair of electrodes, and having a second

Sub
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region with a substantially uniform thickness along the direction wherein said second
region is thinner than the first region stepwise and is disposed in all cases closer to said
discharge port than said first region.

CS
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wherein a size of a bubble generated on the heat generating element
is changed by changing electric energy applied to the heat generating element to generate a
bubble on both the first region and the second region or on only the second region, and
wherein the volume of a liquid droplet discharged from the discharge port is changed, and
wherein said protective coating is composed of plural protection layers, said first region
having more layers than said second region.
